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XXXVIII.—*Note upon two Crania of Crocodiles in the Belfast Museum**. By HUGH FALCONER, M.D., F.R.S. &c.

[With two Plates.]

THE existing Crocodiles are still but imperfectly defined, and there is little agreement among systematic authors regarding the number and characters of the species. This remark applies with especial force to the Crocodiles of the Nile and of the Ganges. Geoffroy assigns five species of true Crocodile to the Nile, all of which are considered by Cuvier as varieties of a single species, *C. vulgaris*. Dumeril and Bibron, in their 'Erpétologie,' published in 1836, follow the view taken by Cuvier, although it would appear from a verbal communication of M. Bibron, that their opinions have been considerably altered since. Mr. J. E. Gray, in his 'Synoptical Catalogue,' published in 1844, admits two species, *C. vulgaris* and *C. marginatus*. In like manner the Crocodiles proper of the Ganges were restricted to a single species by Cuvier, *C. biporcatus*, in which view also he is followed by Dumeril and Bibron, although *C. palustris* of Lesson is inserted with doubt as a variety of *C. vulgaris* in their systematic work; but it would appear from the labels of the specimen in the Paris museum that they now recognise it as a distinct species.

* Communicated by Mr. W. Thompson, President of the Society to which the museum belongs, with the following remarks:—"The crania which form the subject of the present notice, were presented to the Natural History and Philosophical Society of Belfast by Dr. M'Cormac of that town. They were taken in the waters of the Sierra Leone river or its tributaries, and given to that gentleman by his brother, Mr. John M'Cormac of Freetown, Sierra Leone. My friend Dr. Falconer, on visiting the museum with me early in 1845, called my attention to the rarity of these crania. On leaving home for London a few months afterwards, I took the specimens with me for the purpose of comparison with others in the collections there, and the result is set forth in the paper. To the kindness of Mr. Grattan (Treasurer to the Society already named) we are indebted for drawings of the specimens made by means of a camera-lucida. These, for the sake of comparison with the figures in Cuvier's 'Ossemens Fossiles,' have been drawn of the same size."

On the other hand, Mr. Gray gives three species to the Ganges, viz. *C. biporcatus*, *C. palustris* and *C. bombifrons*. It is of interest therefore to record the existence of any specimens bearing upon the disputed or ill-determined species: and having observed the crania of two rare Crocodiles in the museum at Belfast, the following notes regarding them have been drawn up at the request of Mr. W. Thompson.

Crocodilus cataphractus, Cuv. Oss. Fossiles, tom. v. p. 58. pl. 5. figs. 1 & 2; Dum. and Bibron, Erpét. tom. iii. p. 126. *C. leporhynchus*, Bennett, Proc. Zool. Soc. 1835, p. 129. *Mecistops Bennettii* and *M. cataphractus*, Gray, Catalog. pp. 57 & 58.

This species was founded by Cuvier upon an imperfect specimen of unknown origin in the museum of the London College of Surgeons. It was briefly described by Bennett, first as a distinct species from Fernando Po in 1835, and afterwards as a variety of *C. cataphractus* in the 'Zoological Proceedings' of 1836. Mr. Gray has erected it into a separate genus under the name of *Mecistops*, in which he includes along with it the *C. Journei* of Bory de Saint-Vincent, and *C. (Gavialis) Schlegelii* of Müller. So far as is known to us no representations have yet been given of the cranium divested of its integuments. Plate VI. figs. 1, 2 and 3 represent the Belfast specimen, viewed from the top, side and base of the skull. It is evidently identical with Gray's *Mecistops Bennettii*; the head of the stuffed specimen of this nominal species in the British Museum collection agreeing with it exactly in form, and very nearly in size. The muzzle is more attenuated and narrower than in *C. acutus*, but less so than in *C. Schlegelii*, which constitutes the passage from the true Crocodiles into the Garials. The cranial tablet is not so wide as in the Garial, *C. Schlegelii*, and the crotaphite foramina are proportionally smaller. The muzzle does not contract abruptly in front of the orbits, but is gradually attenuated from the back part of the cranium forwards. The extreme width at the condyles of the lower jaw is 7 inches, behind the orbits $4\frac{3}{4}$ inches, and in a line with their anterior border $3\frac{1}{2}$ inches. At the seventeenth or last tooth of the upper jaw the width is $3\frac{5}{8}$ inches, and $1\frac{5}{4}$ between the eleventh and twelfth teeth: there is an expansion to 2 inches opposite the ninth tooth, which is the largest in the head: thence the beak contracts gradually to the space between the fourth and fifth teeth, where the width is only 1 inch; at the extremity of the muzzle, between the second and third teeth, it expands to $1\frac{3}{4}$ inch. The margins, when viewed in plan, are therefore more undulated and less cylindrical than in the Garial or *C. Schlegelii*, and there is less dilatation of the point of the beak.

The orbits are much larger than the crotaphite foramina, which

are separated only by a narrow interval; while in the Garial they are large and wide apart. The lachrymals form narrow slips of bone which descend upon the nasals a considerable way below the anterior margin of the pre-frontals. The nasal bones are extremely narrow and attenuated, but, as in the true *Crocodiles*, they descend between the maxillaries so as to project into a niche between the intermaxillary bones. The same holds good in *C. Schlegelii*; whereas in the Garial the nasals terminate a short way in front of the orbits, and do not enter into the formation of the anterior portion of the beak. This character is a good diagnostic mark between the *Crocodiles* proper and the Garials; separating *C. Schlegelii* from the latter subgenus under which Müller has ranged it. The nasal opening is smooth, oval in form and of moderate size. There are seventeen teeth in the upper jaw, and fifteen in the lower: the largest teeth in the upper, are the third and ninth; in the lower, the first, fourth, tenth and eleventh.

The dimensions are subjoined at page 364.

Crocodilus marginatus (?), Geoff. *Croc. d'Egypt.* 165; Gray, *Catal. Brit. Mus.* p. 61. *C. vulgaris* var. *C.*, Dumeril et Bibron, *Erpétolog.* iii. p. 110. *C. vulgaris*, Cuv. *Annal. du Mus.* tom. x. 40.

The Belfast specimen is doubtfully referred to this species, there not being sufficient materials in the London museums to admit of a satisfactory determination. Neither the College of Surgeons' collection nor the British Museum is possessed of an adult cranium of the common *Crocodile* of the Nile, *C. vulgaris*, or of *C. marginatus*, although there are numerous stuffed specimens attributed to both species in the British Museum collection. The comparison of the Belfast specimen has in consequence been limited to the reduced figure of the skull of *C. vulgaris* in the 'Ossemens Fossiles.'

The cranium is 19 inches long, and must have belonged to an adult animal. The principal distinctive character assigned to *C. marginatus*, both by Geoffroy and by Dumeril and Bibron, in addition to the form of the nuchal and dorsal scutes, is that the borders of the cranial tablet are raised, while in *C. vulgaris* the frontal area is perfectly flat. In the Belfast cranium these lateral margins are also considerably elevated, and the following points of difference from *C. vulgaris* are besides observable. The facial portion of the head is less elongated in proportion to the cranial, and more obtuse than in *C. vulgaris*; the interval between the orbits is greater; the crotaphite foramina are relatively larger; the lachrymals are narrower and descend further upon the nasals; the muzzle is considerably blunter, and the niche for the reception of the fourth tooth of the lower jaw is larger, causing a greater

amount of constriction. The general outline of the muzzle, instead of being acute and subcuneiform, is obtuse and oblong, somewhat resembling the form of *C. palustris* of the Ganges. There is also a marked constriction behind the twelfth tooth, considerably greater than in *C. vulgaris*. The largest teeth are the third, the fourth, and the tenth, the last being the largest of all. The nasal aperture is more circular than in *C. vulgaris*. There is no lower jaw to the Belfast specimen. Plate VII. figs. 1, 2 and 3 represent the cranium, viewed from the top, side and palate, as in *C. cataphractus*.

The dimensions of the cranium are as follow:—

DIMENSIONS.	<i>C. cataphractus.</i> inches.	<i>C. marginatus.</i> inches.
Length of cranium from the point of the muzzle to the occipital ridge	} 15·5	} 16
Length of cranium from the point of the muzzle measured to the condyle of the upper jaw		
Extreme width of cranium at the condyles	7	8·5
Length from occipital ridge to base of nasals	6	6·7
Length from the point of the muzzle to base of nasals	} 9	} 10·7
Length of orbit		
Width of orbit	1·8	2·7
Interval between orbits	1·4	2
Antero-posterior diameter of crotaphite foramen ...	·8	1·5
Transverse diameter of crotaphite foramen	1·1	1·9
Width of the muzzle at the last tooth	·8	1·4
Width of the muzzle at base of the nasals.....	2·8	6·7
Width at contraction behind the twelfth tooth		6·5
Width at the tenth tooth.....		4·8
Width at the ninth tooth.....		6·8
Width at contraction behind the fourth tooth	2	
Greatest contraction behind fifth tooth	1·1	
Dilatation of the point of the muzzle		2·9
Length of the nasal aperture	1·8	4·3
Width of the nasal aperture	·9	2
Length of intermaxillaries on the palate	·75	1·8
Length of maxillaries on the palate	3	3·9
Antero-posterior diameter of palatine foramen.....	6·3	4·1
Transverse diameter of palatine foramen		4·7
		1·9

XXXIX.—On the Development of Vegetable Cells.

By ARTHUR HENFREY, F.L.S.*

[With a Plate.]

IN some observations which I had the honour to lay before this Section at Cambridge last year, I brought forward certain views I had adopted in regard to the multiplication of vegetable cells by division, which I then stated to be to a certain extent hypothetical,

* Read before the British Association, Southampton, Sept. 1846, and communicated by the Author.